

1 What is claimed is:

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- 3 1. A method for executing a work flow in a WFMS having at
- 4 least one process instance executing an original
- 5 process definition, and migrating the said instance to
- 6 a changed definition, said method comprising the
- 7 following steps:
- 8 a) checking each process instance during the execution
- 9 of the original process definition whether the
- 10 process instance meets a migration condition; and
- 11 b) migrating each process instance during the
- 12 execution of the original process definition to a
- 13 modified process definition if the migration
- 14 condition is met.
- 15
- 16 2. A method according to claim 1, wherein checking each
- 17 process instance further comprises the following steps:
- 18 - defining a set of worst case migration points
- 19 (WMP), and
- 20 - migrating the process instance to the modified
- 21 process definition, if its execution has not gone
- 22 beyond anyone of said worst case migration points
- 23 (WMP).
- 24
- 25 3. A method according to claim 2, said step of defining a
- 26 set of worst case migration points (WMP) comprises one
- 27 of the following actions:
- 28 - reading a set of worst case migration points (WMP)
- 29 from an user input, or
- 30 - computing a set of worst case migration points (WMP)
- 31 based upon the original process definition and the
- 32 modified process definition.
- 33

- 1 4. A method according to claim 3, said step of computing a
 2 set of worst case migration points (WMP) comprises the
 3 following steps:
- 4 - defining a set D including all nodes that are changed
 - 5 in the modified process definition with respect to
 - 6 the original process definition;
 - 7 - determining a set P including all predecessor nodes
 - 8 for all nodes belonging to set D;
 - 9 - determining a reachability matrix $R=(r_{ij})$ for all
 - 10 nodes belonging to set P, each row and column in the
 - 11 reachability matrix R representing a node in the
 - 12 order listed in P, wherein a node X representing a
 - 13 column is regarded as reachable from a another node Y
 - 14 representing a row, if there exists a path of arcs
 - 15 forward from X to Y; and
 - 16 - determining the set of worst case migration points
 - 17 from the reachability matrix R.
- 18
- 19 5. A method according to claim 4, wherein the step of
- 20 determining the reachability matrix $R=(r_{ij})$ further
- 21 comprises the following actions:
- 22 - attributing a value of x to each reachability
 - 23 matrix element r_{ij} if the predecessor node
 - 24 corresponding to said column j is reachable from
 - 25 the node corresponding to said row i;
 - 26 - attributing a value of x to each reachability
 - 27 matrix element r_{zz} ; and
 - 28 - attributing a value of y to each reachability
 - 29 matrix element r_{ij} if the predecessor node
 - 30 corresponding to said column j is not reachable
 - 31 from the node corresponding to said row i.
- 32

- 1 6. A method according to claim 5, wherein the worst case
2 migration points are determined by selecting those
3 predecessor nodes for which the elements r_{ij} from the
4 corresponding column add to a value of x .
5
- 6 7. A method according to claim 6, wherein a value of 1 is
7 chosen for x and a value of 0 is chosen for y .
8
- 9 8. A method according to claim 1, wherein said step of
10 checking each process instance during the execution of
11 the original process definition whether it meets a
12 migration condition further comprises of steps for
13 checking whether the node(s) in the original process
14 definition being currently executed is/are also present
15 in the modified process definition.
16
- 17 9. A method according to claim 8, wherein the step of
18 checking whether a node in the original process
19 definition being currently executed is also present in
20 the modified process definition is repeated upon
21 executing of each node(s) of the original process
22 definition until the migration of said process instance
23 is completed.
24
- 25 10. A method for creating a process definition to be
26 executed by a WFMS comprising the following steps:
27 a) defining an original process definition to be
28 executed in a work flow system;
29 b) starting execution of the process instance as per
30 the original process definition ;
31 c) defining a modified process definition;
32 d) checking for each process instance whether a
33 migration condition is met; and

- 1 e) replacing the nodes of the original process
- 2 definition in a running process instance satisfying
- 3 the migration condition by the corresponding nodes
- 4 of the modified process definition.